# SYNOPSIS OF THE THESIS

**Entitled**

# INTER STATE WATER DISPUTES IN INDIA: A CASE STUDY ON GODAVARI RIVER

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## TABLE OF CONTENTS

**CHAPTER-I**

**Deals with Introduction**


| Details | Page |
|---|---|
| 1.1 Introduction: | 01 |
| 1.2 Statement of the Problem | 02 |
| 1.3 Review of Literature | 03 |
| 1.4 Objectives of the Study | 07 |
| 1.5 Hypothesis of the Study | 08 |
| 1.6 Scope of the study | 09 |
| 1.7 Research Gap | 10 |
| 1.8 Research Methodology | 10 |
| 1.9 Limitations of the study | 11 |
| 1.10 Statistical tools | 11 |


**CHAPTER-II**

## Emphasized on constitutional frame work on Inter-State river water disputes


| Details | Page |
|---|---|
| 2.1 Government of India Act, 1919 | 13 |
| 2.2 Government of India Act, 1935 | 13 |
| 2.3 Bill in the Constituent Assembly | 14 |
| 2.4 The Inter-State Water Disputes Act, 1956 | 14 |
| 2.5 The River Boards Act 1956 | 15 |
| 2.6 Amendement Act 2002 (Inter-State River Water Disputes Act, 1956) | 15 |
| 2.7 A] Article 262 of the Indian Constitution | 21 |
| 2.8 B] Entry 17 of Schedule II (List of Countries) of Schedule 7 | 21 |
| 2.9 C] Articles 131 and 136 of the Indian Constitution | 22 |
| 2.10 D] Inter-State River Water Disputes Act, 1956 | 22 |
| 2.11 E] River Boards Act, 1956 | 23 |

## CHAPTER -III

## Inter-State river water disputes in India


| Details | Page |
|---|---|
| 3.1 List of major Inter-State Water disputes | 24 |
| 3.2 Most rivers of India are plagued with interstate disputes | 26 |


## CHAPTER –IV

## Case study on Godavari River


| Details | Page |
|---|---|
| 4.1 Introduction | 28 |
| 4.2 Basin Overview | 29 |
| 4.3 Table 3.2: Physical extent of various sub-basins of Godavari basin | 31 |
| 4.4 State wise breakup of catchment | 32 |
| 4.5 Table3.3 State-wise break up of catchment area of Godavari basin. | 33 |
| 4.6 State wide lift Irrigation and barrages on Godavari River | 33 |
| 4.7 Number of water resource projects | 34 |
| 4.8 Major and medium irrigation projects | 34 |

## CHAPTER -V

## Emphasised on Inter state river water disputes in India Godavari river basin stake Stakeholders Perceptions towards Interstate water disputes:


| Details | Page |
|---|---|
| 5.1 Structural Equation Modelling | 35 |
| 5.2 Table:4.3 Governments policy frame work to resolve the Interstate water disputes (GPISWD) Factors loading variables | 36 |
| 5.3 Table:4.4 Impact of and Water disputes on Socio-economic development of public in the state: Descriptive statistics factor loading Variables | 37 |
| 5.4 Table:4.5 Appropriate mechanism to address the growing social and environmental problems associated with the construction of dams factor loading variables | 38 |
| 5.5 Table:4.6 Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes | 39 |
| 5.6 Factor Analysis | 40 |
| 5.7 Table: 4.13: Kaiser-Meyer-Ohlin Measure and Bartlett's Test | 41 |


## CHAPTER -VI

## Objective Findings Hypothesis Analysis, Conclusion


| Details | Page |
|---|---|
| 6.1 Test of Hypotheses | 41 |
| 6.2 Findings | 42 |
| 6.3 Water-intensive crops | 45 |
| 6.4 FURTHER RESEARCH GAP | 46 |
| List of Publications | 47 |
| Bibliography | 48 |

# CHAPTER-I

# Deals with Introduction

## 1.1 Introduction:

Although India occupies only 3.29 million sqm km geographical area, which forms 2.4 percent of the world's land area with a population of more than 1.21 billion people, India supports about 1/6th of world population but has got only 4 percentage of world's water resources. Besides, India also caters a livestock population of more than 1200 million, which is about 18 percent of world's total (from www.worldometer.info). Provided this huge gap between supply and demand of water in India, its sustainable use and management becomes an inevitable task. India is gifted with a river system comprising more than 20 major rivers with several tributaries. Many of these rivers are rivers flowing through different states (Inter-state Rivers), and this geographical reality has become a bone of contention between different states of India. There are many inter-state rivers in India. The regulation and development of these river valleys continues to be a source of inter-state friction. India is a federal democracy, and most of its rivers cross state boundaries, as such constructing efficient and equitable mechanisms for allocating river flows has long has been an important legal and constitutional issue. Since independence, numerous inter-state river water disputes have erupted in India.

In the process of development of any state or country requires equitable distribution of water sources by way of solving the issues between the respective states. Water Disputes in Inter-State River Water are among the closest problems to Indian federalism today. In rare cases, it can disrupt communication between the various states. The ongoing issues of Godavari, Krishna, Cauvery Water Dispute and the Satluj Yamuna Link Canal case are example. The modern governments should understand and find out solutions to solve the interstate water disputes.

Various courts of the Inter-State Water Disputes Tribunals have been affected to this point, but there have been problems with it. In this article, we take a look at whether it is an opportunity for another tool. The protected system of inter-state water disputes set out in Article 262 of the Constitution is found in sections 130-134 of the Government of India Act, 1935.

According to Article 17 of the State list, water is the head of the State, and as a result, the provinces are permitted to strike. The Constituent Assembly foresaw the development of future water disputes. Some of the provisions of Article 262 refer to the Constitution itself as a result of these conflicts.

India has 25 major tributaries, with many rivers flowing through the region. As river resources are a shared resource, an integrated approach between the provinces, with the full involvement of the Institute, is required for the conservation, equitable distribution and sustainable use of river water. Within the political structure of the Indian government, intergovernmental disputes require the involvement of the Union government in order to find a government solution at two levels: between the countries concerned, and between the Institute and the provinces.

However, rivers in central India have become competitive areas, fueled by conflicting ideas for property rights, erroneous economic resources for food security, a lack of an integrated ecosystem, and increased hydrology that hampers the development of water resources. Such disputes over the management and control of river water have continued since the founding of the Indian republic, long delays to be resolved due to historical, institutional and political factors. In recent years, rising water scarcity, rapid urban and rural demand for clean water, and conflicting political forces have exacerbated the problem.

**1.2 Statement of the Problem:**

The most important problem facing the interstate water dispute is that it does not have the authority to enforce the directions of the tribunal. The Tribunal can only issue the award but does not enforce it. It does not even have the powers of punishment '. These tribunals are challenged in the courts, though the awards are final and binding. The judicial process is essentially a lengthy process, which further delays the dispute. Environmental impact concerns and rehabilitation measures have not been effectively assessed. There will always be very little delay in setting up tribunals and deciding the award. The tribunal's right to represent a dispute under the IWSDA (Inter State water Disputes Act) is based on the central government's view that the issue cannot be resolved through negotiation. The Center sometimes intervenes directly, but in the most undesirable cases, such as sharing the waters of Ravi Beas in Haryana, Jammu and Kashmir, Rajasthan and Punjab, the central intervention is also unsuccessful. Water is an emotional issue as agriculture dominates most of the country. These issues are often used to mobilize people for political purposes. Proper assessment of river water often creates a situation of threat. Water shortage in some areas.

### 1.3 Review of Literature

A lot of analytical work has been carried out on natural water bodies, both fresh water and marine water, throughout the globe and as such a voluminous literature is available on the subject. In view of the above and to understand the topic of research in a better way, appropriate information in the world wide scientific area was collected through literature surveys by the detailed study of various books, internet websites, national and international journals. For the objective of the present research, a critical assess of literature was carried out to gather information on various relevant aspects and the considerable information was collected and reviewed the issues written by the scientist pertaining to the research topic.

Finally literature review was done for collecting information related to Godavari river and the issues of water disputes among the states in the vicinity, studies the reports of various committees and the judgements of the tribunals, and also have analyzed the causes and conundrums arise out of disputes between states. Some information was also collected the opinions of various stakeholders with peripheral details.

The review of Literature shows the proof of work carried out pertaining to the research topic. It was found that various researchers have worked on different aspects related to Godavari River and about the enduring debates on water disputes. There are various institutes and organizations who are involved in the research to bring out a new alternative to find a long term solutions to the outstanding problems, particularly over major rivers in India.

R. Uma Maheswari, 1990 in her book 'WHEN GODAVARI COMES: PEOPLE'S HISTORY OF THE

RIVER JOURNEYS IN THE ZONES OF THE DISPOSSESSED' embodies the real story of Displacement of under develop classes of submerged villages as result of development forced by Polavaram (Indra Sagar) dam under the National multipurpose project Andhra Pradesh – Telangana. This books stands in the different category among the other literature on Development as it genuinely moves in a novel approach and keeps the reader involved through her story telling technique. This piece of literature is devoted to represent rise and fall of India's one of the significant social movements turning into a mere fragmented resistance against construction of a destructive dam and brings a view of Godavari as a geophysical entity to a disputed political Godavari. It fully evokes the pain and horror experiences by the tribal,Adivasi, Dalits, fishing and farming communities because of displacement and deprivation stemming from losing their livelihood. This book also provides a detail account of paradigm of Development tempted by money and profits by phrasing it as "Investment induced Displacement" which is more to control lives and less to facilitate them to repair the damages.

The author gives details of the problem very concisely. Her argument glides through the experience of her journey into the submerged villages through her account of alterations on the ground from the years 2006 to 2013, along the Godavari to delve into realities and labeled it as "people's journey" through her sight. Her work and unfolding of experiences are aided by some tremendous black and white images. Her research is noticeable due to her long stay in the locality because that endows with a clear picture of so-called R and R strategies engendering more and more sufferings especially in health and education sectors. Her work is mostly derived from her diary notes, observations, conversations with locals and other relevant stakeholders and most importantly her gradual increased scene of emotional association with Godavari in a human perspective. Writer intends almost utterly on people's voices from the apprehension of submergence zone. It is not the description of history through chronological order of events or in term of an archival past but a description of a present stirring into the past where river will not be more than an economic commodity. Writer calls it as people's history because it is simply not an issue of controlling waters but injuring their feelings of belonging and association with river to maintain their livelihood from generations.

Chauhan B.R in his book 'Settlement of International and Inter-State Water Disputes in India' gives the detailed picture of Godavari River, the genesis of the river and the genesis of the disputes revolving around Godavari River. He mentioned, Greater portion of the area drained by the Godavari receives much more rain from the south-west monsoon (June to September) than from the north-east monsoon. The river, therefore, brings down most of its water between June and September. The water level begins to rise at Dowlaishwaram some ten days after the southwest monsoon sets in at Bombay, usually about the middle of June and it is almost continuously high till the end of September. High floods during October arc rare. The l100d season ends by October but during the next two months there are occasional freshets caused by north-cast monsoon over that part of the catchment which comes under its inl1uence. After the north-cast monsoon rains have ceased, the river gradually goes down. It also talked about the topography of the river in a very precise manner, which gives a vivid geographical picture of the river from its origin to fall into the sea. The later part in the book discuss the genesis of thedispute that happened over the years between states, ascertained the causes, which certainly give a degree a of knowledge to understand the disputes from different perspectives to be more clear. However, this book the first major irrigation work, namely, the Godavari Delta Canal system in the then Province of Madras, was completed in 1877. In Province of Bombay, the Godavari Canals Ex-Nandur-Madhmeshwaram and UIC Pravaru canals carne into operation in 1915-1916 and 1926 respectively. The Wainganga canals of the Central Provinces and U1C Nizarnsagar Project of the State of Hyderabad came into operation in 1923 and 1931 respectively. But the irrigation works were still

few in number and the water supply was ample in relation to the demand upon it. At length, this book reported the details of the various tribunal's reports and findings.

Karupannan, 2010 reported that, Water is the most important natural resource for mankind; all living beings in air, water and land like animals and birds; besides all vegetation's, plants, trees and crops. Without water no cultivation and growth of forests, trees and consequently sustenance of life creations is possible. Water, rivers and storages are everywhere in the world for all to use and grow. It gives the historical background information of rivers and its importance, how did river help in evolving the various civilizations across the globe. Vert meticulously documented the historical narratives, he said Great civilizations and cities developed initially and flourished only on the banks of the rivers. The Egyptian Civilisation (on the Nile), the Mesopotamian Civilisation (on the Tigris and Euphrates), the Indian Civilisation (on the Indus) and the Chinese Civilisation (on the Hawange). In South India Godavari is the major river, on the banks of which major Civilisation rose and prospered. This study covers the historic agreements between the riparian States, river water sharing, the disputes, and formation of Tribunal to resolve the dispute, the representations/arguments put by the parties concerned, Tribunal's interim final awards and implementation of the awards. The study also covers the irrigation development, reservoir constructions in the basin States.

Gautam, 1990 reported that India is a country having various land forms and rivers. There are 14 major rivers in India. Water, the universal solvent because of high dielectric constant has the property of dissolving most of the substances but the access of these substances leads to water pollution.

Trivedy J.R. et. al., 1992 mentioned in their study that most of the cities and towns have developed along the banks of rivers because of the multipurpose-use of river water. But unfortunately some rivers are being polluted by indiscriminate disposal of sewage and industrial wastes.

M. V. V. RAMANA 1993 in his book 'INTER-STATE RIVER WATER DISPUTES IN INDIA' Inter-state river water disputes in India have become an inflammatory problem for the past several years. They have become instruments of political unity and have led to many senseless acts of violence. This book provides a balanced survey of the history of inter-state river water disputes in India. It examines legal procedures for resolving river water disputes and suggests steps to be taken to resolve such disputes in the future. An important feature of the book is the latest analysis of the Cauvery waters conflict. This book is a real help in understanding the basics of interstate river water conflicts in India.

**Pradeep Damodaran** 2014 in his book 'The Mullaperiyar Water War: The Dam That Divided Two States' The Mullaperiyar Dam in Kerala, built in the late 1800s after a 999 year lease with the British government, was intended to diverge the Periyar River into the arid areas of Madurai. Today, the

engineering miracle has become a dispute between the two states of Kerala and Tamil Nadu, which are concerned about the height of the Tamil Nadu dam and the safety of Kerala. The conflict has led to riots and protests in two states. Despite the Supreme Court ruling in Tamil Nadu in May 2014, there are concerns that the dam will explode. Water Wis, a timely, insightful exploration of conflict, examines all aspects of the burning issue in contrast to livelihood and security. Using interviews with government officials, technicians, police personnel and the general public of both states, the author draws opinions from both sides, sometimes risking his own safety. He pointed out how water conflicts will become a major issue not only in the states but also between countries in the coming period. This book must be read to understand the importance of solving the explosion problem in the near future.

**OUP India (Author), Philippe Cullet (Editor), Sujith Koonan(Editor), 2017 in his book 'Water Law in India: An Introduction to Legal Instruments'** First published in 2011, The only book that provides a comprehensive survey of water law in India is the water law in India. It provides a variety of national and state-level instruments, making it a complex and diverse field of water law and policy. This book fills a critical gap in the study of water law, providing a great reference point for all the legal mechanisms available in India. This edition has been extensively amended to include new instruments on water control, the draft National Water Framework Bill, 2016, and the Model Groundwater (Sustainable Management) Act, 2016; Water-related equipment in various fields such as the Criminal Law, the Land Acquisition Act and the Rural Employment Act; And a chapter on international legal instruments. Drinking water supplies, environmental measures of water conservation, water infrastructure for irrigation and flood control, groundwater control and water supply companies have been fully updated for full coverage of the Water Act.

**Itzchak E. Kornfeld** 2019 in his book '**Transboundary Water Disputes: State Conflict and the Assessment of their Adjudication'**Kornfeld explores the impact of North American international courts and interim arbitration tribunals on adjudicating transboundary water disputes and allocating scarce water resources. He noted the development of water law, taking into account sovereignty, jurisdiction and scientific evidence. The most challenging aspect of climate change is the increased pressure on water resources through limited drought and new rainfall patterns, which are intensified by rapid modernization. Because of these facts, disputes across national borders are common to use and access water. This study analyzes the history and verdicts of transboundary water disputes in five international courts and tribunals, two US Supreme Court cases, and border water disputes in the United States and Canada and the United States and Mexico. Describing the circumstances and consequences of these cases, Kornfeld asks how effective the courts and tribunals are in sentencing them. What remedies are they devising and how do they deal with polycentric and sovereign issues?

This timely work examines the principle of equal allocation of transboundary water resources and how this provision can be incorporated into international law.

**T S Nath** 2013 in his book '**Irrigation and Interlinking of Indian Rivers'** Indian Rivers Irrigation and Interlinking India Rivers Interlinking is a large-scale civil engineering project that reaches many rivers in India and reduces water scarcity in some parts of India. Although critics oppose the project, India's reliance on agriculture for the monsoon season and the gradual reduction of agriculture in the GDPR will benefit India. To have an idea of its origin along the individual Indian major rivers and its tributaries, the book is discussed in detail, in flow and in ecology. They also discussed how to resolve interstate water sharing disputes based on well-known international cases.

Hemant Pathak 2016 in his book 'Interlinking Rivers Project of India Kindle Edition' National River Linking Project (NRLP) has been proposed as a solution to water related problems in India. It is intended to transfer water surplus basins to water deficient basins in the south and west. Today India is experiencing annual floods and droughts, both occurring in different areas at the same time, which is a big concern for India.These concerns are even more acute today as rising populations and rising water demands place a heavy burden on disproportionately distributed water resources and cause enormous economic risks to the economically weaker sections of the population.

This ambitious project was launched at a time of fierce opposition to large dams. While environmentalists have questioned the environmental cost of large dams, NGOs and civil society have examined the social cost of displacement of people.The book provides an important guide for researchers, which provides: various aspects of the National River Linking Project in the current scenario.Simply described, Reverse Interlinking in India: A Socio-Economic Environmental Evaluation is an important book that brings together diverse perspectives from opponents and state agencies and regulators who want to make a difference in how we plan, protect and manage our rivers.

### 1.4 Objectives of the Study:

The main objectives of this study are as follows:

1. To examine the Government of India policy and framework to resolve the Inter state river water disputes: with special reference to Godavari River
2. To evaluate the present level of issues and problems in respect of Interstate water disputes and effective solutions
3. To change the appropriate mechanism to address the growing social and environmental problems associated with the construction of dams related to the water disputes

4. Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes
5. Identify gaps in this research analysis and suggest new approaches that will adequately address issues Interstate water disputes (political, social, economic and environmental), and set out other objectives and processes to find out the strategic solutions to solve the Interstate water disputes to bring father developing economy.

**1.5 Hypothesis of the Study:**

The formulation of the treaty, based on sound political considerations, should be done in an institutional environment that ensures fair representation of nations. History has shown that suspicion has always disrupted the political process, especially in the provinces controlled by opposition political parties or federations and in the case of countries controlled by opposition parties. This hatred has contributed to the effectiveness of existing institutional procedures. This study adopted the following hypothesis to understand the to solve the Interstate water disputes in India with special reference to Godavari river.

Hypothesis formulated:

**Hypothesis-I** Governments policy frame work to resolve the Interstate water disputes**:**

H0: There is no significant impact of state/Central/Tribunals role to resolve the Interstate water disputes in India.

H1: There is a significant impact of state/Central/Tribunals role to resolve the Interstate water disputes in India.

**Hypothesis-II** Impact of Water disputes on Socio-economic development at Godavari river basin.

H0: There is no significant Impact of Water disputes on Socio-economic development at Godavari river basin.

H1: There is a significant Impact of Water disputes on Socio-economic development at Godavari river basin.

**Hypothesis-III** Appropriate mechanism to address the growing social and political problems associated with the construction of projects.

H0: there is no appropriate mechanism to address the growing social and political problems associated with the construction of projects; and water disputes between the states connected with Interstate water disputes

H1: there is an appropriate mechanism to address the growing social and political problems associated with the construction of projects; and water disputes between the states connected with Interstate water disputes

**Hypothesis-IV** Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes
H0: there is no proper Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve interstate river water disputes in India
H1: there is a proper Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve interstate river water disputes in India

**1.6 Scope of the study:**

It has been considered desirable to prepare separate study devoted Interstate river water disputes relating of Godavari river. In Indian context 85% Indian territory lies with in its major and medium inter state river basins. India has 14 major rivers which are all Inter-state rivers.

In India, in connection with the resolution of inter-state disputes relating water has not been very happy. It is not easy to say whether this is due to the nature of the dispute political factors and inadequacy of the constitutional provisions on the subject.

The tribunals appointed under the Inter-state water disputes act to adjudicate upon them have so far produced no results. Our Indian constitution makers anticipating such situations have provided ample power to the union to enable it to deal with them with its powers of legislation under entry 56 of list-1 which empowers it to legislate for the regulation and development of Inter-state rivers and river valleys to the extent, to which such regulation and development under control of the state is declared by parliament by law to be expedient in the public interest such action by the union. It is urged will have the advantage of ensuring a quick solution of these disputes arrived at from the national perspective.

## 1.7 Research Gap:

Previous studies were carried out on various river water disputes. Several studies have viewed at the different various river systems in India. The present study centred on inter state river water disputes in India. The study focused on the interstate river water in India and special out look on Godavari river basin and its river water disputes. Particularly on Godavari river water disputes, agreements, major and minor river water projects and topography of Godavari river system. The present study therefore tried to fill the research void with the title "Interstate river water disputes a case study on Godavari river".

## 1.8 Research Methodology:

The research approach is an important aspect of any research project as it provides a clear path to transition from the research phase to the data analysis. It helps to draw a broad but relevant framework for research by explaining flexibility, setting research objectives where research questions and ideas are born. This research study present work is case study of an empirical nature and it is mainly based on secondary data. Both primary and secondary data is collected in respect to solve the Interstate water disputes.

This continues to help guide the researcher to move forward or within the defined range of the subject under study. With clear research methods, it is easier for the researcher to select appropriate data collection methods and techniques, population size and final sampling methods that will help come out with the right conclusions and recommendations.

The main emphasis of this study is on interstate river water disputes in between Indian states. Archives records, including official records, journals, and institutional reports, are the main resources. A historical approach has been added to complete this study. Tables and pictures are arranged based on available text.

Today, Godavari's water conflict is deeply divisive, involving the emotional, cultural, economic, and, most important, the political interests of the various parties. Therefore, the study focuses on the political perspective of the Indian River water disputes, especially the Godavari water dispute, to cover all the many issues of Godavari water violence.

Explaining the political situation in the watershed, efforts have been made to revise the official documents from time to time. The investigation includes early disagreements, court hearings, court judgments, arbitration records, official documents, and water board reports to ensure ongoing discussions on water disputes in recent years.

**1.9 Limitations of the study:**

- The present study confined to interstate water disputes in India.
- The study examined the various inter state river water sharing disputes, agreements and complete case study on Godavari river.
- The study has examined the Godavari river basin stake holders perception on river water disputes and agreements.
- It has opinions on the respondents may not accurate due to non awareness on river water disputes.
- The present study has considered only two issues i.e. inter state water disputes in India and conducted comprehensive study on Godavari river basin and its disputes on various river water projects.

**1.10 Statistical tools:**

In order for the researcher to come up with a complete and scientifically valid analysis of his research to be used to find a sound conclusion, analysis tools ranging from simple to complex science have played a major role. Data analysis involves a variety of tasks from data processing to hypotheses testing. In this study, simple and complex scientific methods and / or instruments were used. Simple ways to integrate with tools such as a spreadsheet used for data processing and clear presentation of data while the sophisticated scientific tool SPSS was used for data analysis. Major statistical tools / techniques such as descriptive statistics, Regression, Correlation, ANOVA, T-test, Factor Analysis and Cronbach alpha were used.

**Chaptarization Plan**

**Chapter-I**

**Deals with Introduction**

**Chapter-II**

**Emphasized on constitutional frame work on Inter-State river water disputes**

**Chapter-III**

**Focused on Inter-State river water disputes in India**

**Chapter-IV**

**Focused a case study on Godavari river**

**Chapter-V**

**Emphasised on Inter state river water disputes in India Godavari river basin stake holder perception**

**Chapter-VI**

**Objective Findings Hypothesis Analysis, Conclusion**

# CHAPTER -II

## Emphasized on constitutional frame work on Inter-State river water disputes

### 2.1 Government of India Act, 1919

The subject has an interesting history. When dyarchy was introduced in the Provinces (in British India) under the Government of India Act, 1919, irrigation became a Provincial, but "reserved" subject. Before the Provincial Government could take up any project involving the interests of more than one Province, the prior approval of the Secretary of State had to be obtained.

### 2.2 Government of India Act, 1935

(a) The Government of India Act, 1935 (Provincial List, Entry 19) placed irrigation within the sole jurisdiction of the Provinces.
(b) However, sections 130 to 133 of the Act of 1935 made detailed provisions as to inter-Provincial, etc., disputes concerning water. The relevant provisions applied to "States" also, i.e., to those Indian States, which may ultimately join the contemplated federation. Any Province or State whose interests were perpetually affected in respect of water supplies from a natural source, owing to the action of another Province or State, could complain to the Governor General.
(c) The Governor General was required to appoint a Commission to investigate and report to him on the matters to which the complaint related (unless, in his opinion, the issues were not of sufficient importance).
(d) After consideration of the report, the Governor General was to give such decision as he deemed proper.
(e) The order of the Governor General was to be binding upon the parties. However, before the Governor General gave his decision, the Governor of any State (or the ruler of a Princely State), affected by the order, could require the Governor General to refer the matter to His Majesty in Council, which could give such decision as it deemed proper.
(f) Jurisdiction of the Federal Court (or any other court) was barred, if action to lodge a complaint had been taken by the Governor of a Province, etc.

### 2.3 Bill in the Constituent Assembly

In the draft Constitution, the corresponding provision (articles 239 – 242 of the draft) contained propositions substantially similar to those contained in sections 130 – 133 of the Government of India Act, 1935, except that the President was substituted for the Governor General and the reference of a dispute was to be by the President to the Supreme Court under the latter‟s advisory jurisdiction. (Jurisdiction of all other courts was barred).

### Dr. Ambedkar's revised draft

For simplicity and effectiveness, Dr. Ambedkar recast the whole scheme. Article 242A (as revised by him), was in the same form as present article 262.[x]

## ENACTMENTS RELATING TO INTER-STATE WATERS

### 2.4 The Inter-State Water Disputes Act, 1956

Pursuant to the power conferred by the Constitution (article 262), Parliament has enacted the Inter-State Water Disputes Act, 1956. Its main features can be thus summarised:

(a) A State Government which has a water dispute with another State Government may request the Central Government to refer the dispute to a tribunal for adjudication.

(b) The Central Government, if it is of opinion that the dispute cannot be settled by negotiation, shall refer the dispute to a Tribunal.

(c) The Tribunal‟s composition is laid down in the Act. It consists of a Chairman and two other members, nominated by the Chief Justice of India from among persons who, at the time of such nomination, are Judges of the Supreme Court.

(d) The Tribunal can appoint assessors to advise it in the proceedings before it.

(e) On the reference being made by the Central Government, the Tribunal investigates the matter and makes its report, embodying its decision. The decision is to be published and is to be final and binding on the parties.

(f) Jurisdiction of the Supreme Court and other courts in respect of the dispute referred to the Tribunal is barred.

(g) The Central Government may frame a scheme, providing for all matters necessary to give effect to the decision of the Tribunal. The scheme may, *inter alia*, provide for establishing an authority for implementing (section 6A).

## 2.5 The River Boards Act 1956

(a) The River Boards Act, 1956, provides for the establishment of River Boards, for the regulation and development of inter-State rivers and river valleys.

On a request received from a State Government or otherwise, the Central Government may establish a Board for "advising the Government interested" in relation to such matters concerning the regulation or development of an inter-State river or river valley (or any specified part) as may be notified by the Central Government.

(b) Different Boards may be established for different inter-State rivers or river valleys.

(c) The Board is to consist of the Chairman and such other members as the Central Government thinks fit to appoint. They must be persons having special knowledge and experience in irrigation, electrical engineering, flood control, navigation, water conservation, soil conservation, administration or finance.

(d) Functions of the Board are set out in detail in section 13 of the Act. Subject-wise, they are very wide, covering conservation of the water resources of the inter-State river, schemes for irrigation and drainage, development of hydro-electric power, schemes for flood control, promotion of navigation, control of soil erosion and prevention of pollution.

But the functions of the Board are advisory and not adjudicatory.

(e) By section 14(3), the Board is directed to consult all the Governments concerned and to secure their agreement, as far as possible.

Thereafter, by section 15, the Board is empowered to frame schemes, obtain comments of the interested Governments and finalise a scheme. [Section 15(4)] But the schemes do not seem to have a mandatory force. It appears from section 15(5) and section 15(6) of the Act that:

(i) The Board can advise the Governments concerned as to execution of the scheme and

(ii) The Central Government can "assist the Governments interested", in taking such steps as may be necessary, for execution of the scheme.

## 2.6 Amendement Act 2002 (Inter-State River Water Disputes Act, 1956)

The Inter-State River Water Disputes Act of 1956 regulates the settlement of water disputes in India. It was amended in 2002 to include the recommendations of the Sarkaria Commission. The amendments are as follows:

1- The Tribunal must be formed within one year of receiving the application.

2- The court must award the award within 3 years. However, an additional two years may be granted in certain circumstances. Therefore, the Tribunal must award the prize within 5 years.

3- The Tribunal Award is not used immediately and the parties concerned may require clarification within 3 months of being awarded.

The 4- Tribunal Awards will have the same power as an order or decision of the Supreme Court. This award is final and is beyond the reach of the Supreme Court.

Problems with the Inter-State River Disputes Tribunals

1- Prolonged proceedings and delays in the settlement of disputes. For example, the Cauvery Water Disputes Tribunal. The Tribunal formed in 1990 presented its award in 2007.

2- Although the award given by the Court of Justice is final and beyond the jurisdiction of the courts, states or individuals may approach the Supreme Court under Article 136 (Special Leave Petition) and Article 32 by linking the dispute to a violation of Article 21 of India's Constitution.

3- Composition of the Tribunal is not a multi-faceted matter as it consists of people appearing only in the courts. Therefore, there is no significant difference between the Tribunal and the Bench of the High Court.

4- Due to the lack of access to authorized water information, it is difficult to even set the basis for judgment.

5- The change in the approach to assisting Councilors facilitates extended and political cases of water-sharing disputes.

6- With the dramatic growth between water and politics, disputes have been referred to the political structures of the electoral bank. It has led to an increase in international insults, extended cases and the dissolution of solutions. For example, the Ravi-Beas Tribunal.

7- Due to India's solidarity, colonial heritage, and policy problems involving many stakeholders in governments and organizations, there is a lot of understanding in the many stages of the process.

To address the aforementioned issues and to expedite the resolution of foreign disputes, the Government Rivers Water Dispute Amendment Bill, 2019 was introduced by the Institute.

Inter-State Water Dispute Amendment Bill, 2019.

On 25 July 2019, the River Rivers Water Amendment Bill was introduced by Jal Shakti Minister Gajendra Singh Shekhawat. The Bill provides for the settlement of disputes over the waters of various countries' rivers and river valleys.

The Act states that the State Government may request the Central Government to refer a dispute between rivers within the Tribunal for a decision. If the Central Government believes that the dispute cannot be resolved through negotiations, it appoints the Water Disputes Tribunal to adjudicate the dispute, within a year of receiving the complaint. The Bill seeks to replace this approach.

The Inter-State River Water Disputes (Amendment) Bill, 2019 seeks to streamline the above. It introduces a mechanism to resolve the dispute by negotiations through a Disputes Resolution Committee, to be established by the Central Government, before such a dispute is referred to the

Tribunal. The Bill further seeks to provide for a single standing Tribunal (with multiple Benches) instead of multiple Tribunals, and the total time period for adjudication of a water dispute by the Tribunal has been fixed at a maximum of four and half years. The decision of the Bench of the Tribunal shall be final and binding on the States concerned, with no requirement of its publication in the Official Gazette.

**Salient features of the Bill**

The Bill consists of 13 Sections. The major features of The Inter-State River Water Disputes (Amendment) Bill, 2019 are given below:

**Tribunal:** The Central Government will establish a Tribunal, to be called the Inter-State River Water Disputes Tribunal, for the adjudication of water disputes. This Tribunal can have multiple benches. All existing Tribunals will stand dissolved, and the water disputes pending adjudication before such existing Tribunals will be transferred to the new Tribunal. (Section 3(4))

**Disputes Resolution Committee:** Under the Bill, when a State puts in a request in respect of any water dispute, the Central Government will set up a Disputes Resolution Committee (DRC), to resolve the dispute amicably. The Dispute Resolution Committee shall try to resolve a water dispute by negotiations within a period of one year which may be extended to a further period of six months and submit its report to the Central Government. The report submitted by the DRC shall contains the details of; (i) the Stand taken by each State which are party to the Dispute during negotiation; (ii) the views of members of the Committee on such stand; and (iii) all relevant facts, information and data relating, thereto. Any water dispute which cannot be settled by negotiation shall be referred by the Central Government, by notification, to the Tribunal for its adjudication with in a period of three months from the date of receipt of the report from the DRC. (Section 3(4A)) The DRC will comprise of a Chairperson, and experts with at least 15 years of experience in relevant sectors, to be nominated by the Central Government. It will also comprise one member each to represent States who are party to the dispute (at the level of Joint Secretary to the Government of India), to be nominated by the State Government concerned.

**Composition of the Tribunal:** The Tribunal will consist of a Chairperson, a Vice-Chairperson, and not more than three judicial members, and three expert members. They will be appointed by the Central Government on the recommendation of a Selection Committee. (Section 4B) The Selection Committee will consist of the Prime Minister or any other Minister nominated by him, as Chairperson; the Chief

Justice of India or a judge of the Supreme Court nominated by him, as Member; the Minister in charge of the Ministry dealing with the Law and Justice, as Member; and the Minister in charge of the Ministry of Jal Shakti, as Member. (Section 4B (2))

**Amendment of Section 5:** On receipt of a reference in respect of any water dispute from the Central Government, the Chairperson shall assign such dispute to a Bench of the Tribunal for its adjudication. The Bench of the Tribunal investigate the water dispute assigned to it and forward to the Central Government its detailed report setting out the facts as found by it including on yield, efficiency in the use of water and such other matters as may be prescribed, and giving its decision on such dispute within a period of two years. Provided further that if the report cannot be given within a period of two years for any unavoidable reasons, the Central Government may extend such period to a further period not exceeding one year.

**Decision of the Tribunal:** The decision of the Bench of the Tribunal shall be final and binding on the parties to the dispute and shall have the same force as an order or decree of the Supreme Court. (Section 6)

**Data bank:** The Central Government shall, for the purposes of maintaining a data bank and information system at the national level for each river basin, appoint or authorise an agency to maintain data relating to water resources, land, agriculture and such other matter, containing such particulars and in such manner, as may be prescribed. The agency has powers to summon and verify any data, record or other relevant information received from the State Government. (Section 8 (9A))

Tabular presentation of differences made by the Bill to the existing Act

| **Inter-State Water Dispute Act 1956** | **Inter-State Water Dispute (Amendment) Bill, 2019** |
|---|---|
| Under Section (4)Act, when any request is received from the State Government in respect of any waterdispute, a separate Tribunal has to be established for each inter-State river water disputes. | By substitution of new section under3(4),the Bill provide for a single standing Tribunal(with multiple Benches)instead of multiple Tribunals. All existing Tribunals shall stand dissolved and the water disputes pending adjudication before such existing Tribunals shall stand transferred to the new Tribunal Constituted under the Bill. |
| There is no provision in the Act for the constitution of Dispute Resolution Committee. | By Substitution of Section 3(4(A)),the Bill proposes to introduce a mechanism to resolve the water dispute amicably by negotiations through a Disputes Resolution Committee, to be established by the Central Government consisting of experts from relevant fields, before such dispute is referred to the Tribunal |
| Under section (5)Act, the tribunal should forward its report to the Central Government with in a period of 5 years, which may be extended by the Central Government, for such further period as it considers necessary. | Amendment of Section5 of the Act, the bill prescribes the total time period for adjudication of a water dispute by the Tribunal has been fixed at a maximum of four and halfyears. |
| Under Section(6) of the Act, The Central Government shall publish the decision of the Tribunal in the Official Gazette and the decision shall be final and binding on the parties to the dispute and shall be Given effect to by them. | Under Section (6) of the bill proposethat the decision of the Bench of theTribunal shall be final and binding on the States concerned. |

Article 246 of the Constitution deals with the subject matter of laws to be made by the Parliament and by the Legislatures of the States. The allocation of responsibilities between the Centre and the States in respects of laws to be made fall into three categories –

1. The Union List (List – I)
2. The State List (List –II)
3. The Concurrent List (List –III)

Subject of 'water' is a matter at Entry 17 of List –II, i.e. State List. This Entry is subject to the provisions of Entry 56 of List –I, the Union List. The specific provisions in this regard are as under:

**List - I Union List**

"56. Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest."

**List - II State List**

"17. Water that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List - I."

Article 262 of the Constitution deals with adjudication of water disputes. The provisions in this regard are:

**Article 262 (1)**

"Parliament may, by law, provide for the adjudication of any dispute or complaint with respect to the use, distribution or control of the waters of, or in, any inter-State river or river valley."

**Article 262 (2)**

"Notwithstanding anything in this Constitution, Parliament may, by law, provide that neither the Supreme Court nor any other court shall exercise jurisdiction in respect of any such dispute or complaint as is referred to in clause,

Four Acts, three under Entry 56 of List –I namely, the "River Boards Act 1956", "Betwa River Board Act 1976" and "Brahmaputra Board Act 1980" and the fourth one under Article 262, namely, the "Inter-State River Water Disputes Act, 1956" are the legislations so far enacted by the Indian Parliament under the above Constitutional provisions.

Details of Constitutional Provisions and Central Water Laws are available in 'Legal Instruments on Rivers in India Vol I'

Inter-State River Water Disputes Act, 1956 as amended upto 2002 is available at 'Inter-State River Water Disputes Act, 1956.

## 2.7 A] Article 262 of the Indian Constitution

Article 262(1) provides that Parliament may adopt legislation for the settlement of disputes or complaints concerning the use, distribution or control of transboundary waters in a river or river valley. According to Article 262(2), Parliament may adopt a law which may impede the jurisdiction of the Supreme Court or of any other court in relation to the dispute/appeal referred to in Article 262 (1).

According to Rule 262(1), Parliament may "enact" a specific law. This shows that it is up to Parliament to pass such a law. Article 262(2) also states that 'Parliament may legislate …'. For the purposes of Article 13(3) of the Constitution, the term "law" may therefore include law, order, law, regulation, regulation, notification or legal force in India. The topic of such a right could be a transnational river or river valley.

Article 262(2) begins with the phrase "despite this constitution …". This means that other provisions of the Constitution that violate Article 262(2) are not applicable. For example, when examining Article 262(2), Article 131 does not apply, which provides for the primary jurisdiction of the Supreme Court in disputes between two or more States. If Parliament loses jurisdiction of the Supreme Court for cross-border river water disputes, it must do so through the mechanism referred to in Article 13(3), as the term "legal" is used.

If the Parliament has not enacted any legislation under Article 262(2), it may refer to the Supreme Court or higher court. The term "may" is used here, which means that the introduction of such a law depends on Parliament's discretion.

## 2.8 B] Entry 17 of Schedule II (List of Countries) of Schedule 7

Entry 17 of Schedule II (List of Countries) of Schedule 7 includes water sources, irrigation and canals, drainage and oak, reservoir and hydropower. The provisions for water supply, irrigation or hydropower apply to transnational rivers. Most cross-border disputes over rivers are related to these issues. Therefore, the government would have the right to adopt laws on these issues. However, this competence of the national government depends on the provisions of Article 56 of Schedule I.

List I (Union List), read in conjunction with Article 246(1) of the Constitution, entry 56 gives Parliament the right to adopt laws on the regulation and development of the river and valleys. Countries to the extent that these regulations and Parliament confirm that development is in the public interest. Entry 17 explicitly states that the provisions of point 56 of Annex I apply to such government power.

Entry 17, which is contrary to the law adopted by Parliament under point 56 of Schedule I, would not prevail. Article 246 of the Constitution is also important in this debate. " 246(1) uses the words "Regardless of what is in paragraphs 2 and 3". This means that, notwithstanding the provisions of Article 246(2) and (3), Parliament has the exclusive right to authorize the subjects listed in List I in legislation. the words "points 1 and 2" and state that the government has the exclusive right to legislate on the subjects listed in List II, taking into account paragraphs 1 and 2).

Thus, while water resources are a national responsibility, Parliament has considerable legislative powers in this area. These powers of Parliament are important enough to be able to prevent any legislation adopted by those countries that is in conflict with their parliamentary provisions.

## 2.9 C] Articles 131 and 136 of the Indian Constitution

There have been cases where countries have used Articles 131 and 136 of the Constitution in cross-border river basin disputes. For example, Tamil Nadu filed a preliminary complaint in 2001 of Article 131, in which it stated that interim measures were not effectively regulated. The States of Karnataka, Tamil Nadu and Kerala, disturbed by the decision of the Cauvery Water Dispute Tribunal in 2007, have applied for a special permit pursuant to Article 136. The Supreme Court accepts them.

## 2.10 D] Inter-State River Water Disputes Act, 1956

The 1956 Law on Water Disputes was adopted pursuant to Article 262 of the Constitution. The center plays a very important role in the law. Article 4(1) of the Act, which is empowered to establish a water court to challenge water law on the basis of a county government.

Pursuant to Article 5(2) of the Act, the Civil Service Tribunal shall, within three years, send a report to the central government containing the facts and the decision thereon. The decision of the court is published by the central government in the official gazette. After publication in the Official Journal of the European Union, the decision has the same value as the order or order of the Supreme Court.

Thus, the central government can deal with the Commission, which is obliged to execute court orders. The government can make judgments. The Center can dissolve the tribunal. Sec. 11 excludes the jurisdiction of the Supreme Court and other courts pursuant to law.

This law does not exclude the central government, but interferes with various aspects of the court. The arbitral tribunal shall submit its report to the central government and shall therefore have jurisdiction.

In the resolution of disputes concerning river water, the central government is in the hierarchy of the respective state governments and their dependent court.

## 2.11 E] River Boards Act, 1956

Although the Rivers Act was passed in 1956, no river basin was formed under this Act. However, it is important to study this law in order to analyze the role of the Center in the dispute between rivers between states, as set out in this Act.

According to Section 2 of the Act, the Center should control the development and development of transnational rivers and river valleys. At the request of a regional government, the Center may establish a river council. The term used herein is "may", which means that the flow rate depends on the discretion of the central government. The Agency may prepare, amend or reject river or river development projects between countries.

By law, the central government gives the Council the power to perform its tasks. The term used here is "as deemed necessary by the central government", which means that the amount paid to the Board of Directors clearly depends on the discretion of the central government, which is an annual report to the central government and the governments of the countries concerned.

This shows that the Council is responsible for its actions towards the central government. The central government has the opportunity to develop rules for achieving the goals of the law. It therefore appears that the termination of the Board of Directors seems necessary "if the central government agrees".

While the main actors in the dispute are the respective national governments, how the conflict with the central government takes place is up. The mechanisms established for the adjudication of such disputes are accountable to the Central government and owe their very existence to the Central government. Thus, to say that water and Inter-State water disputes falls within the domain of State governments due to its presence in the State List is a fallacy. The Central government plays an equally, if not more important role in inter-state river water disputes.

# CHAPTER -III

## Inter-State river water disputes in India

The Inter-State Water Disputes Act, 1956, is conducting Inter-State River Water Disputes. Would the Central Government feel that a state government's request on any water dispute and that the water dispute through the negotiations has not been resolved? The Water Disputes Tribunal was formed for the inquest into water dispute.

### 3.1 List of major Inter-State Water disputes[1]

According to the information shared by the government in the Lok Sabha, a list of inter-state water disputes is given below.

| S.No. | Name of Tribunal | States Concerned | Date of Constitution | Present Status |
|---|---|---|---|---|
| 1 | Godavari Water Disputes Tribunal | Maharastra, Andhra Pradesh, Karnataka, Madhya Pradesh & Odisha | April,1969 | Award given on July,1980 |
| 2 | Krishna Water Disputes Tribunal-1 | Maharastra, Andhra Pradesh, Karnataka | April,1969 | Award given on May,1976 |
| 3 | Narmada Water Disputes Tribunal | Rajasthan, Madhya Pradesh, Gujarat and Maharashtra | October,1969 | Award given on December,1979 |
| 4 | Ravi & Beas Water Tribunal | Punjab, Haryana & Rajasthan | April,1986 | Report and decision given in April, 1987. Clarification/explanation sought from the Tribunal by the party states. Also, a presidential reference in the matter is before Supreme Court and as such the |

| | | | | |
|---|---|---|---|---|
| | | | | matter is sub-judice. |
| 5 | Cauvery Water Disputes Tribunal | Kerala, Karnataka, Tamilnadu and Puduchery | June,1990 | Report and decision given on 5-2-2007. A special leave petition (SLP) field by party states in Hon'ble Supreme Court, as such the matter is sub-judice. |
| 6 | Krishna Water Disputes Tribunal-II | Karnataka, Telangana, Andhra Pradesh and Maharashtra | April,2004 | Report and decision given on 30-12-2010. However, as per Supreme Court order dated 16.9.2011, till further order, decision taken by the Tribunal on reference filed by states and central government shall not be published in the official Gazette. As such, matter is sub-judice. Term of the tribunal has been extended for a further period of two years w.e.f. 1st August,2014 to address the terms of reference as contained in section 89 of Andhra Pradesh reorganization Act,2014. The term of KWDT-II has further extended for period of one year. w.e.f. 1st August,2016. The matter is under adjudication in the Tribunal. The government of Telangana filed a SLP 33623-26 of 2014 and WP(C) 545 of 2015 in the Hon'ble Supreme Court in the matter. The matter is sub-judice. |
| 7 | Vansadhara Water Disputes Tribunal | Andhra Pradesh & Odisha | February,2010 | Report and decision not given by the tribunal. State of Odisha has filed an SLP in Supreme Court against the appointment of one of the members of the tribunal. The SLP in the matter filed by the state of Odisha in the Supreme Court is pending. The matter is sub-judice. Besides, Vansadhara water disputes tribunal in its order dated 17.12.2013 has directed to constitute a 3-member protem supervisory |

| | | | | |
|---|---|---|---|---|
| | | | | flow management and regulation committee on river Vansadhara to implement its order. State government of Odisha has filed special leave to appeal (Civil) No.3392 of 2014 with regard to the Vansadhara water disputes tribunal judgement dated 17.12.2013. the matter is sub-judice. |
| 8 | Mahadayi Water Disputes Tribunal | Goa, Karnataka & Maharashtra | November,2010 | Report and Decision not given by the Tribunal. |

[5] GOVERNMENT OF INDIA MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION LOK SABHA UNSTARRED QUESTION NO. 3053 ANSWERED ON 03.08.2017

### 3.2 Most rivers of India are plagued with interstate disputes.[9]

Almost all major rivers in the country share interstate rivers and their waters by two or more states. After independence, the rapid growth of population increased due to population growth, agricultural development, urbanization, industrialization etc. These developments have caused many inter-state disputes to share the waters of these rivers.

***Following the interstate river water is worth mentioning the controversy.***

i. Cauvery water dispute between Tamil Nadu, Karnataka and Kerala.

ii. Krishna water dispute between Maharashtra, Karnataka and Andhra Pradesh.

iii. Tungabhadra water dispute between Andhra Pradesh and Karnataka.

iv. Controversy between Aliyar and Bhivani river waters between Tamil Nadu and Kerala.

v. Godavari river water dispute between Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Orissa and Karnataka.

vi. Narmada water dispute between Gujarat, Maharashtra, Madhya Pradesh and Rajasthan.

vii. The Mahi River dispute between Gujarat, Rajasthan and Madhya Pradesh.

viii. Controversy between Ravi and Beas River waters between Punjab, Haryana, Himachal Pradesh, Rajasthan, Jammu and Kashmir and Delhi.

ix. The Satluj-Yamuna linkage dispute between Punjab, Haryana and Rajasthan.

x. Yamuna River water dispute between Uttar Pradesh, Haryana, Himachal Pradesh, Punjab, Rajasthan, Madhya Pradesh and Delhi.

xi. Karmanasa River water dispute between Uttar Pradesh and Bihar.

(xii) The Barak River water dispute between Assam and Manipur.

# CHAPTER -IV
# Case study on Godavari River

## 4.1 Introduction:

The Godavari river is bounded by the Mahadeo Hills of the Satpura Range in the north, the Western Ghats in the west, Eastern Ghats of the Dandakaranya region of Odisha, Chattisgarh and Andhra in the east. The onterior a part of the basin lies in geographical area and in a very snese the Godavari basin bisects the tableland of Maharasthra. The basin also covers the Vidarbha Plain and the forest covered Wainganga valley. The area is wealthy in natural vegetation that covers the rugged craggy land[1]. Godavari, the Dakshin Vahini Ganga, originates at Associate in Nursing elevation of 1067 meters within the Brahmagiri Hills of the Western Ghats in Nashik District of geographic region and continues its journey over 1465 kms within the south east to satisfy the Bay of Bengal at Narasapuram in West Godavari district of Andhra Pradesh. Like several Indian rivers, Godavari's origin is consecrated with a Shiva Temple, the Trimbakeshwar, which is also one of the 12 Jyotirlingas (most of them near a river). And like several different rivers, it has an elaborate myth and a hymn in its honour. The watercourse features a sister, Gautami, right at its origin in Maharashtra and again a distributary called Gautami right where the river falls into the sea in Andhra Pradesh. The watercourse mainstem, longest in Peninsular India, travels through three states, Maharashtra, Telangana and Andhra Pradesh, while its basin includes Madhya Pradesh, Karnataka, parts of Chattisgarh and Odisha. It traverse through 3 agroclimatic zones, 6 agro ecological zones and supports an astounding array of biodiversity and communities. More than sixty million folks decision Godavari Basin their home. The basin includes vital cities like Nashik, Nagpur, Wardha, Nanded and Chandrapur from Maharashtra and Bhadrachalam, Nizamabad, Mancherial&Ramagundam in Telangana, Rajahmundry &Narsapur in Andhra Pradesh and Seoni&Balaghat in Madhya Pradesh. The watercourse is taken into account no but a sister to Ganga. Nashik is an important religiously not only as the birthplace of this Dakshin Vahini Ganga, where she refused to fall into the Arabian Sea, but also because of the deep association of the city with Ramayana. Nashik was believed to be an area of Dandakaranya wherever Lord Ram resided for nearly fourteen years in Vanavasa.

[1]The South Asian Network on Dams, People and Rivers report on ' Godavari's Story'

[2]The South Asian Network on Dams, People and Rivers report on ' Godavari's Story'

All along the watercourse in places like Tapovan, one will notice glimpses of this ancient story loved these days[2]. On the banks of Godavari in Nashik conjointly stands the KalaRam Mandir wherever, in 1930, Babasaheb Ambedkar launched the KalaRam Mandir Entry Satyagraha, storming the temple that was to date restricted for the depressed classes. Indeed, Godavari has borne witness to many outstanding happenings at her origin itself.

**4.2 Basin Overview:**

The major river basins are the hydrological planning units. For water resource management, the Basin is recognised as a functioning hydrological unit. Individual water resource development projects must be assessed as part of the overall basin strategy. Godavari is India's second largest river basin, covering roughly 9.5percent of the country's total land area. Maharashtra(48percent), Telangana (18.8 percent) Andhra Pradesh (4.5 percent), Chattisgarh (12 percent), Odisha (5.7 percent), and minor portions of Madhya Pradesh (7.8%), Karnataka (1.4 percent), and the Puducherry Union are included in this programme (0.01percent).(SeeTable1)1st Figure The geographical position of the Basin is depicted in Figure1.The reservoir is divided into two sections: complete drainage, which flows into BengalBay, and rivers into BengalBay, which are usually characterized by canal drainage at the exit.

The Godavari Basin covers a total area of 312812.0 km2. It measures 302065,10 km2 and has a maximum width and length of 995 and 583 km. Between 73°24" and 83°4, and 16°19' to 22°34'between east and north, the basin is located on the Deccan Plateau. Satmala's northern basins, Satmala Hills, the northwestern Ajanta, Ghats to the west, Ghats to the south, and blackh at to the east and southeast are all bordered by the Mahadeo Hills. The Maharashtra plateau, which is300-600 metres east of the basin's centre, is home to the basin's heart. The Eastern Ghats, which run along the peninsula'seastern border, mostly include the basin's eastern half. Dandakaranya.

The Godavari River, eventually the biggest on the peninsula and its main affluents into BengalBay, is the essential component of the water system. At 1067 m in the western Ghats near the hills of Triambak in Nasik district of Maharashtra, the Godavari River originates. Godavari islocated on the right bank of Darna, Prava and Manjra, whilst on the left side there are Kadwa,Purna, Kadam, Pranhita and Indravati. In the southwest monsoon season, the Godavari basin receives much of its precipitation. The Godavari Delta gradually approaches the sea andcomprises a wide range of alluvial rivers.

| S.No. | Feature | Description |
|---|---|---|
| 1 | Basin Extent | 73°24’ to 83o4 E 16°19’ to 22°34’ N |
| 2 | Area (Sq.km) | 312812.00 (CWC Reported) |
| 3 | States in the basin | Maharshtra-48.7% Andhra Pradesh-23.7% Madhya Pradesh-7.8% Odisha-5.7% Karnataka-1.4% Chhattisgarh-12.4% Puducherry-0.01% |
| 4 | Districts(Census 2011) | 55 |
| 5 | Parliamentary Constituencies (2009) | 55 |
| 6 | Mean Annual Rainfall (mm) | 1093.21 |
| 7 | Mean Maximum Temperature (°C) | 33.04 |
| 8 | Mean Minimum Temperature (°C) | 20.63 |
| 9 | Total Population ( As per Census 2001) | 60489310 |
| 10 | Number of villages (As per Census 2001) | 43492 |
| 11 | Highest Elevation (m) | 1664 |
| 12 | Avg. Annual Water Potential (BCM) | 110.540 |
| 13 | Utilizable Surface Water (BCM) | 76.30 |
| 14 | Number of Sub Basins | 8 |
| 15 | Number of Watersheds | 466 |
| 16 | Number of water resources structures | Dams (921) Barrages (28) Weir (18) Anicuts (1) Lifts (62) Power House (16) |
| 17 | Highest Dam | Bandardhara Dam-82.35 m |
| 18 | Longest Dam | Sriramsagar(SRSP) Pochampad dam-15.6 km |
| 19 | Highest Barrage | Kolar barrage-15.5 m |
| 20 | Longest Barrage | Kolar barrage-1.195 km |
| 21 | Number of Irrigation projects | Major-70 Medium-216 ERM-6 |
| 22 | Number of HE projects | 14 |
| 23 | Number of Ground water observation wells | 1875 |
| 24 | Number of Hydro-Observation Sites | 88 |
| 25 | Number of Flood Forecasting Sites | 18 |
| 26 | Water tourism sites | 53 |

The Godavari basin has been divided into 12 sub-basins by Godavari Water Disputes Tribunal (GWDT) viz. (1) Upper Godavari (from the source toits confluence with the Manjra (2) Pravara, (3) Purna, (4) Manjra, (5) MiddleGodavari (from its confluence with Manjra to confluence with Pranhita), (6)Maner, (7) Penganga, (8) Wardha, (9) Pranhita, (10) Lower

Godavari (from its confluence with Pranhita up to the sea),(11)Indravati and(12)Sabari.

**4.3 The physical extent of varioussub basins of Godavari basin is indicated in Table**

**Table 3.2: Physical extent of various sub-basins of Godavari basin**

| Index | Subbasin | Extent |
|---|---|---|
| G-1 | UpperGodavari | Includes the catchment from source of Godavari to itsconfluence with the Manjra. Excludes the catchment areas of the Pravara, the Purna and the Manjra but includes that of all other tributaries which fall into the Godavari in this reach. |
| G-2 | Pravara | Includes the entire catchment of Pravara from the source to its confluence with the Godavari including Areas of Mula and other tributaries of the Pravara. |
| G-3 | Purna | Includes the entire catchment of the Purna (from Source to its confluence with the Godavari) including all its tributaries. |
| G-4 | Manjra | Includes the entire catchment of Manjra from its source to its confluence with the Godavari including catchment areas of Tima, Karanja, Haldi, Lendi, ManerAnd other tributaries. |
| G-5 | MiddleGodavari | Comprises the catchment of the Godavari from its confluence with Manjra to its confluence with Pranhita. Includes all its tributaries in this reach, except the Maner and the Pranhita. |
| G-6 | Maner | Includes the entire catchment of Maner from its source To its confluence with the Godavari, including all its tributaries. |
| G-7 | Penganga | Includes entire catchment of Penganga from its source To its confluence with Wardha with all its tributaries. |
| G-8 | Wardha | Comprises the catchment of river Wardha from its source to its confluence with Wainganga with all its tributaries but excluding the catchment of Penganga |
| G-9 | Pranhita | Comprises the catchment of Wainganga from its source to its confluence with Wardha and the Pranhita up to its confluence with Godavari. Includes all the tributaries of Wainganga and Pranhita except Penganga and Wardha. The Wainganga after its confluence with Wardha is called Pranhita. |

| | | |
|---|---|---|
| G-10 | LowerGod avari | Consists of the lower part of Godavari from its confluence with Pranahita up to the sea. Includes direct catchment of the Godavari in this reach with all its Tributaries except the Indravati and the Sabari. |
| G-11 | Indravati | Includes all the areas drained by Indravati and its tributaries from its source to its confluence with the Godavari. |
| | Sabari | Includes entire catchment of Sabari river from its source to its confluence with the Godavari including its tributary Sileru. |

*Source:GodavariWaterDisputesTribunal(GWDT)Award*

**4.4 State wise breakup of catchment**

The catchment of the first three sub-basins viz. the Upper Godavari, the Pravara and the Purna lies entirely in the State of Maharashtra. The drainage areaof Manjra sub-basin is contributed by the three States of Maharashtra, Karnataka and Telangana. The middle Godavari sub-basin lies mainly in the State of Telangana. The Manjra sub-basin lies completely within Telangana while the drainage area of Penganga sub- basin is contributed by Maharashtra and Telangana. Madhya Pradesh and Maharashtra contribute to Wardha and Pranhita sub-basins. A part of Chhattisgarh also falls in Pranhita sub-basin. Telangana, Andhra Pradesh and Chhattisgarh contribute to Lower Godavari sub-basin. The catchment area of the Indravati sub-basin lies partly in Chhattisgarh and partly in Odisha. The last sub-basin, Sabari lies in the territories of AndhraPradesh, Chhattisgarh and Odisha. The State wise breakup of the catchment area of thewhole Godavari basin is indicated in **Table 3.3** While the sub-basin/State wisedistribution ispresentedin**Table3.4.**

**4.5 Table3.3 State-wise break up of catchment area of Godavari basin.**

| Sl. No. | State | Catchment area (Sq.km) | %of the basin area |
|---|---|---|---|
| 1. | Maharashtra | 152199 | 48.7 |
| 2. | Karnataka | 4406 | 1.4 |
| 3. | MadhyaPradesh | 31821 | 10.2 |
| 4. | Chhattisgarh | 33434 | 10.7 |
| 5. | Telangana | 57829 | 18.4 |
| 6. | AndhraPradesh | 15372 | 4.9 |
| 7. | Odisha | 17752 | 5.7 |
| | **Total** | **312813** | **100.00** |

*Source: WaterbalancestudiesofNWDA*

**4.6 State wide lift Irrigation and barrages on Godavari River**

Water resources projects in the basin include Irrigation projects, Hydro Electric projects and Extension, Renovation and Modernization projects. Nearly 286 major / medium irrigation projects are there in the river basin. Sriram Sagar Stage I (Pochampad), Ghopewara Upsa Sinchai Yojana, Jayakwadi (Pathan) Project, Godavari Delta, Sripad Sagar (Yellampalli), Pench Project, Jayakwadi (Manjal Gaon) Project, Potteru (Central), Purna Project, and Godavari Upper Canal are some of the major commands in the basin. The number of the water resources projects is listed in table.

### 4.7 Number of water resource projects

| Sl. No. | Type of Projects | Number of Projects |
|---|---|---|
| 1 | Major Irrigation Projects | 70 |
| 2 | Medium Projects Irrigation | 216 |
| 3 | ERM Projects | 6 |
| 4 | Hydro-Electric Projects | 15 |

### 4.8 Major and medium irrigation projects

The dependable yield for the basin is utilized under number of major, medium and minor irrigation projects of the basin. Irrigation is being carried out in the area under these projects viz., dams, barrages, diversion structures and other lift irrigation systems.

Prior to independence only a few irrigation projects were constructed in Godavari basin.

Important among these are Godavari delta system (with Dowlaiswaram weir as head works).

After independence, under various five-year plans a large number of multi-purpose and irrigation projects have been taken up.

# CHAPTER -V

## Emphasised on Inter state river water disputes in India Godavari river basin stake Stakeholders Perceptions towards Interstate water disputes:

The stakeholder satisfaction towards impact of Interstate water disputes the cronbach was observed to be 0.925 which is dominantly in satisfactory range of 0.50 to 0.99.The correlation value of cronbach alpha factor presence of cross item impact. The reliability of 0.925 signifying satisfactory achievement of internal consistency of theresponses towards Government policy to solve the Interstate water disputes.

### 5.1 Structural Equation Modelling

The structural equation modeling determination the linkages across the input and the output variables in respect of the impact of Interstate water disputes towards key factors i.e Governments Policy frame work to resolve the Interstate Water Disputes (GPISWD), Impact of and Water Disputes on Socio-economic Development of public in the state (IWDSED), Appropriate Mechanism to address the growing social and Environmental problems associated with the Construction of Dams (AMECD), Stakeholder (Public, Government, NGOs, Courts and Tribunals) Involvement and Contribution to Solve Interstate River Water Disputes (SCISWD)

The regression weights and the interpret the relationships across the constituent variables in current research activity towards the impact of Interstate water disputes towards key factors i.e Governments Policy frame work to resolve the Interstate Water Disputes (GPISWD), Impact of and Water Disputes on Socio-economic Development of public in the state (IWDSED), Appropriate Mechanism to address the growing social and Environmental problems associated with the Construction of Dams (AMECD), Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and Contribution to solve Interstate River Water Disputes (SCISWD).

The observation of structural relationships between the latent variable observed to lead to a system of regression equations that pictorially depicts regressive dependencies across the factors as assumed for the current study. The path diagrams also represent the relationships that exist with the latent variables and their observable indicators. The use of SEM has highly

essential in this study to ascertain the determination of connected aspects of the PPP model for research and analysis. The research based analysis points towards the incidence of the impact across factors concerned.

*The details of stakeholder resopndents surveyed during the research study that the managemnt implementation aspects to understand the efficiancy and effectiveness of finding solutions to solve the interstate water disputes of projects and its contribution to the economy and public.The following Hypotheses has considered in this study to understand the* (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes.

**5.2 Table: 4.3 Governments policy frame work to resolve the Interstate water disputes (GPISWD) Factors loading variables**

| **Factor** | **Variable** | **Facto Loading** | **Reliability Coefficient** | **Eigen Value** | **% Variation Explained** |
|---|---|---|---|---|---|
| (GPIS WD) | Committees to solve the water issues | 0.692 | 0.8657 | 4.886 | 32.455 |
| | Government policy direction | 0.855 | 0.7237 | 1.766 | 10.664 |
| | Amicable dispute resolution procedure | 0.686 | 0.8666 | 4.866 | 30.412 |
| | Effective Information system on Rivers | 0.884 | 0.7037 | 1.722 | 12.636 |
| | Project's success factors and water | 0.694 | 0.8627 | 4.876 | 34.452 |
| | Realistic and detailed cost-benefitsofdams | 0.884 | 0.7037 | 1.762 | 10.648 |
| | Networking of interstates | 0.696 | 0.8647 | 4.876 | 30.462 |
| | Equitable usage of Water resources | 0.854 | 0.7437 | 1.762 | 10.648 |

Source: Data compiled from the field study

The above table presents the Governments Policy frame work to resolve the Interstate Water Disputes (GPISWD) Factors loading variables Factors loading variables reliability coefficients, Eigen value and the percentage of variation in respect of sub variables under the study. The study has observed the strong association among the variables loaded.

**5.3 Table: 4.4 Impact of Water disputes on Socio-economic development at Godavari river basin.**

| **Factor** | **Variable** | **Facto Loading** | **Reliability Coefficient** | **Eigen Value** | **% Variation Explained** |
|---|---|---|---|---|---|
| IWDSE | Finding best solutions for solving interstate waters disputes | 0.655 | 0.8663 | 4.886 | 32.462 |
| | Responsiveness of public and social benefits | 0.822 | 0.7074 | 1.755 | 12.648 |
| | Development outcomes of interstates | 0.634 | 0.8655 | 4.855 | 35.455 |
| | Tangibility benefits and dams | 0.841 | 0.7044 | 1.722 | 12.644 |
| | Way of approach to solve interstate waters disputes | 0.662 | 0.8622 | 4.855 | 32.442 |
| | Adopting best management practices | 0.855 | 0.7144 | 1.744 | 10.644 |

Source: Data compiled from the field study

The above table presents the Impact of and Water disputes on Socio-economic development of public in the state: Descriptive statistics factor loading Variables reliability coefficients, Eigen value and the percentage of variation in respect of sub variables under the study. The study has observed the strong association among the variables loaded.

**5.4 Table: 4.5 Appropriate mechanism to address the growing social and environmental problems associated with the construction of damsfactor loading variables**

| Factor | Variable | Factor Loading | Reliability Coefficient | Eigen Value | % Variation Explained |
|---|---|---|---|---|---|
| AMECD | Environmental issues | 0.642 | 0.8633 | 4.852 | 31.456 |
| | Issues of irrigation dams | 0.824 | 0.7042 | 1.712 | 11.699 |
| | Creating awareness on River projects | 0.644 | 0.8652 | 4.826 | 32.422 |
| | Safe guarding of environmental | 0.854 | 0.7042 | 1.742 | 12.643 |
| | Reliablejudgment to solve the issues | 0.684 | 0.8666 | 4.876 | 34.444 |
| | Knowledge on irrigation projects | 0.844 | 0.7077 | 1.712 | 12.638 |
| | Politicalsupport | 0.664 | 0.8644 | 4.846 | 31.412 |
| | Stable macroeconomic condition | 0.874 | 0.7056 | 1.742 | 12.638 |

Source: Data compiled from the field study

The above table presents the Appropriate mechanism to address the growing social and environmental problems associated with the construction of damsfactor loading variables reliability coefficients, Eigen value and the percentage of variation in respect of sub variables under the study. The study has observed the strong association among the variables loaded.

**5.5 Table: 4.6 Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes**

| Factor | Variable | Factor Loading | Reliability Coefficient | Eigen Value | % Variation Explained |
|---|---|---|---|---|---|
| SCISWD | Irrigation project development goals | 0.632 | 0.8647 | 4.846 | 30.442 |
| | Public understanding on how to solve River water disputes | 0.814 | 0.7437 | 1.752 | 10.658 |
| | Detailedprojectplanning and stakeholder involvement | 0.624 | 0.8657 | 4.846 | 30.442 |
| | contribution to solve Interstate River water disputes | 0.864 | 0.7637 | 1.772 | 10.688 |
| | Selecting the rightproject solution | 0.654 | 0.8637 | 4.856 | 30.462 |
| | Environmental impact oftheproject and NGOs understanding | 0.854 | 0.7237 | 1.742 | 10.668 |
| | Courts and Tribunals judgment | 0.634 | 0.8647 | 4.856 | 30.452 |
| | Government support and role | 0.885 | 0.7044 | 1.733 | 10.668 |

Source: Data compiled from the field study

The above table presents the Infrastructure and Stakeholders factors (ISF) factor loading variables reliability coefficients, Eigen value and the percentage of variation in respect of sub variables under the study. The study has observed the strong association among the variables loaded.

### 5.6 Factor Analysis

To identify the factors determining Factor analysis of the variables in respect of the impact of the impact of Interstate water disputes towards key factors i.e Governments policy frame work to resolve the Interstate Water Disputes (GPISWD), Impact of and Water Disputes on Socio-economic Development of public in the state (IWDSED), Appropriate Mechanism to address the growing social and Environmental problems associated with the Construction of Dams (AMECD), Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River Water Disputes (SCISWD).

### 5.7 Table: 4.13: Kaiser-Meyer-Ohlin Measure and Bartlett's Test

| | | |
|---|---|---|
| **KMO Measure of Sampling Adequacy** | .785 | |
| **Bartlett's Test of Sphericity** | Approx. Chi-Square | 1762.44 |
| | df | 124 |
| | Sig. | .000 |

Source: Data compiled from the field study

The factor analysis has resulted in four key factors i.e. the impact of Interstate water disputes towards key factors i.e. Governments policy frame work to resolve the Interstate water disputes (GPISWD), Impact of and Water disputes on Socio-economic development of public in the state (IWDSED), Appropriate mechanism to address the growing social and environmental problems associated with the construction of dams (AMECD), Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes (SCISWD).

These four key factors were found to have Eigen values greater than1and, hence, are significant and there liability coefficients of these factors range from0.6to0.8.The factor loading of the variables has determining factor, there liability coefficient of the (Cronbach alpha), the Eigenvalue and the percent of variation explained by the factors.

# CHAPTER -VI

## Objective Findings Hypothesis Analysis, Conclusion

**6.1 Test of Hypotheses:** Interstate water disputes and Stakeholder participation

| | |
|---|---|
| **Hypothesis-I** Governments policy frame work to resolve the Interstate water disputes**:** | |
| H0: There is no significant impact of state/Central/Tribunals role to resolve the Interstate water disputes in India. | Rejected |
| H1: There is a significant impact of state/Central/Tribunals role to resolve the Interstate water disputes in India. | Accepted |
| **Hypothesis-II** Impact of Water disputes on Socio-economic development at Godavari river basin | |
| H0: There is no significant Impact of Water disputes on Socio-economic development at Godavari river basin. | Rejected |
| H1: There is a significant Impact of Water disputes on Socio-economic development at Godavari river basin. | Accepted |
| **Hypothesis-III** Appropriate mechanism to address the growing social and political problems associated with the construction of dams | |
| H0: there is no appropriate mechanism to address the growing social and political problems associated with the construction of dams; and water disputes between the states connected with Interstate water disputes | Accepted |
| H1: there is an appropriate mechanism to address the growing social and political problems associated with the construction of dams; and water disputes between the states connected with Interstate water disputes | Rejected |
| **Hypothesis-IV** Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes | |
| H0: there is no proper Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve interstate river water disputes in India | Rejected |
| H1: there is a proper Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve interstate river water disputes in India | Accepted |

**6.2 Findings:**

The study recommended that to involve the Stakeholder (Public, Government, NGOs, Courts and Tribunals) involvement and contribution to solve Interstate River water disputes. This participation will provide good scope to resolve the Interstate River water disputes in an amicable manner.
Developing efficient solutions to water conflicts will require expertise in environmental and natural resource economics – including valuation of water resources and related infrastructure, calculation of economic damages related to water pollution and loss of wetlands habitat, cost-benefit analysis, market design, water conservation policies, and water issues related to climate change.

Indian water dispute settlement mechanisms are ambiguous and opaque. The study distinguish analytically between situations where co-operation is possible, and situations of pure conflict, where the initial allocation of rights is at stake. In the latter case, a search for a negotiated solution may be futile, and quick movement to arbitration or adjudication may be more efficient. However, in India, the process is slow, and effectively binding arbitration does not exist. The entanglement of inter-state water disputes with more general centre-state conflicts and political issues compounds problems.

The study observes that impacts can be reduced by a more efficient design of mechanisms for negotiating inter-state water disputes: some of the possibilities include a national water commission independent of daily political pressures, a federated structure incorporating river basin authorities and water user associations and fixed time periods for negotiation and adjudication.

In this study, a framework is developed to consider collective action, sustainability and the capability approach with regard to resolution of water disputes, followed by a brief discussion of how identity can hinder cooperation or the development of universalism.

This framework is then examined with a case study of the Godavari river dispute in India. At the heart of river water disputes are issues related to justice and fairness, which depend to a significant extent on: how citizens perceive their claims over river water (shaped by cultural and historical factors); the extent to which citizens are able to collectivize their claims

through location, economic activity and identity, and use their voice to influence the state; the extent to which the state policy and actions reflect the ‘voice’ and collective interests of different groups; and how the various riparian states recognize and deal with each others' claims. The framework discussed here suggests that the capability approach provides us with a much broader framework than collective action to resolve the water disputes.

India has witnessed several river water-sharing disputes in the past. The disputes between upper riparian states and the lower ones are based on conflicting water use demands: these are often attempted to get resolved through the announcement of Water Tribunal awards or litigation in the courts. The solutions to resolve water-sharing disputes, to begin with, should include steps for conserving water in various sectors. There has to be a continuous dialogue among stakeholders on the various aspects of water-sharing. A permanent forum should be constituted for this purpose. The resolution of water-sharing disputes should not be only in the domain of governments. All stakeholders must come forward to discuss and crystalise issues for their effective resolution.

Karnataka recently witnessed protests over the Mahadayi river water-sharing dispute with Goa. This dispute, originating in the 1980s, arose out of conflicting demands of water use between the two states. Karnataka claims 7.56 tmc ft. of water from the Mahadayi River to meet its requirements. Goa claims that its population is dependent on river water, and the proposed design of dams on the river by Karnataka would not affect not only its people but also affect the river's fragile ecosystem. Karnataka is of the view that the surplus from the Mahadayi drains into the sea, and this should instead be diverted into the deficit basin to meet the state's need for drinking, irrigation, agriculture and power generation.

River water-sharing disputes are not new in India. We have witnessed many such disputes in the past. Recent disputes worth mentioning are the Cauvery river dispute between Karnataka and Tamil Nadu, the Sutlej-Yamuna Canal Link (SLY) dispute between Punjab and Haryana, Polavaram dam construction dispute over Godavari River between Andhra Pradesh and Orissa, etc. The disputes between upper riparian states and the lower ones are based on conflicting water use demands: these are often attempted to get resolved through the announcement of Water Tribunal awards or litigation in the courts. Most of the existing water-sharing disputes are locked up in the apex court for resolution.

Is legal recourse to resolve water-sharing disputes enough? The answer is an emphatic no. The reasons are that there are spatial variations of water availability and that the existing supply of water resources is far short of the demands of water use. By 2050, it is expected that India, as a whole, could be categorised as a 'water scarce' country when measured in terms of per capita annual availability of water. Surface water available in rivers, lakes, ponds, etc., coupled with groundwater resources, will not be enough to meet the ever-increasing demand for water for agriculture, industry or domestic sectors.

Water-sharing issues are highly politicised and are also emotive. The underlying issues are often ignored and the obvious ones are stressed upon. For example, the Cauvery water dispute hardly recognises the fact that the yield of the river is decreasing over the years. In some months in the post-monsoon period, the river water is so scarce that it does not even reach the sea. It is also not recognised that the groundwater depletion affects water availability in Cauvery River. Nor is it recognised that the farmers in Tamil Nadu are using water-intensive crops such as Samba, Kurivai and Thaladi rice varieties. Relying only on legal remedies to resolve water-sharing disputes may not solve the core issues underlying these disputes.

Are there any solutions that go to the core of the ever-increasing water-sharing disputes? The solutions, to begin with, should include steps for conserving water in various sectors. For example, in the domestic sector, leakage of piped water use should be minimised, thus reducing the quantum of non-revenue water. Waste water should be used as a resource through its recycling and reuse. In the industry sector, water use efficiency should be increased through adopting zero water discharge measures. In the agriculture sector, use of technology such as micro-irrigation would improve the water use efficiency. There was about 47% increase of coverage area under micro-irrigation in India during 2016-17 over the previous year, yet its estimate during 2017-18 is only about 12 lakh hectares. There is thus enormous scope for increasing micro-irrigation coverage in the coming years.

Second, groundwater depletion should be arrested through suitable recharging of the water aquifers. Over the past 30 years, India has seen a 13% decline in the water table. There are huge overdrafts of groundwater in some states. For example, in Punjab, more than 100 blocks are overexploited, and the state of groundwater development is unsustainable. Unless this trend is arrested, water quality will continue to reduce, affecting the availability of safe water.

### 6.3 Water-intensive crops

Third, India uses about 80% of water for agriculture. During the 'Green Revolution', more reliance was placed on water-intensive crops. Crop diversification declined sharply in many states. Water-intense crops such as rice (to produce 1 kg of rice, about 3000-5000 litres of water are required), sugarcane, and cotton are often encouraged through subsidised power. Governments in some states have taken steps to encourage crop diversification, but there is a need to train farmers on sowing of coarse cereals, and to encourage their consumption amongst the public.

Fourth, all stakeholders should adopt certain well-known international principles for water-sharing. For example, these include adopting the principle of equitable and reasonable water utilisation, and the principle of requiring the states to take all appropriate measures to prevent significant harm to other states. In India, there is no legislative backing covering these principles, although courts and Water Tribunals often adopt these practices.

Fifth, the states must cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain the optimal utilisation and adequate protection of rivers.

Finally, the states should adopt a mechanism for exchange of data and information on a regular basis. There has to be a continuous dialogue among stakeholders on the various aspects of water-sharing. A permanent forum should be constituted for this purpose. The resolution of water-sharing disputes should not be only in the domain of governments. All stakeholders must come forward to discuss and crystalise issues for their effective resolution

**6.4 FURTHER RESEARCH GAP:**

The present study has been focused on the interstate river water disputes a case study on Godavari river. The study suggested few areas for the future studies based on the current study.

1. The present study emphasized on the interstate river water disputes a case study on Godavari river.

   Hence the study suggest examining the reliable mechanism for interstate river coordination and collaboration our river water disputes in India.
2. The study suggest policy challenges and governance on interstate river water disputes.
3. The study recommends to examine the political behaviour and attitude towards the settlement of interstate river water disputes special reference with Godavari river.
4. The study suggest to examine the interstate river water disputes are a continuing challenge to Indian federal governance.


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# LIST OF PUBLICATIONS

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**2. M.SATYAPRAKASH AND DR.V.R.PATANGE,**

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